

FAUNA OF THE CHILKA LAKE.

HIRUDINEA.

By W. A. HARDING, *M.A., F.L.S.*

(With 2 text-figures.)

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HIRUDINEA.

By W. A. HARDING.

Dr. Annandale has placed in my hands a large collection of Indian Hirudinea and my hearty thanks are due to him for the opportunity of examining so large a body of interesting material. The results of my work upon this collection will appear in due course and I confine myself here, at Dr. Annandale's request, to a report upon the leeches obtained during the investigations by Dr. Kemp and himself on the fauna of the Chilka Lake. These consist of examples of three new Rhynchobdellid species, whilst the general collection of Indian Hirudinea just referred to contains examples from this lake of another Rhynchobdellid species, a colour-variety of the widely distributed *Glossosiphonia heteroclita*. It will be convenient to deal with this leech first.

Glossosiphonia heteroclita, Linn. (1761).

This well-known leech occurs in North America and throughout the greater part of Europe and it is now recorded from India for the first time. It is not peculiar to the Chilka Lake, and in the general collection are examples from many parts of India, showing it to be widely distributed there. The Indian examples agree with the normal type, with the exception of black markings present on the pale golden-yellow dorsal surface. European specimens are generally free from black pigment, but Apáthy (1888, p. 790) describes a variety (*striata*) having black transverse stripes, more or less broken, on every third ring.

Castle (1900, p. 42, pl. viii, fig. 38) finds in the United States various gradations between the typical yellow form, and a form with transverse striae and an irregular longitudinal mid-dorsal band. The Indian examples have the black pigment disposed in a broken mid-dorsal line and further investigations may prove that they represent a new variety.

The examples of this species, collected by Dr. Annandale at Lake Chilka in March, 1910, are accompanied by the following notes:—

- (a) Found "among weeds in pond. Rambha, S. end of Chilka Lake."
- (b) From "S. end of Chilka Lake."

[This leech appears to be very common on freshwater molluscs of the genera *Vivipara* and *Pachylabra* all over India. In the Chilka Lake it is only found in flooded areas of fresh or practically fresh water.—N.A.]

Piscicola olivacea, n. sp.

(FIG. I.)

FORM, SIZE, COLOUR.

The circular and exceedingly long and slender body of this little leech resembles in general form that of the *Piscicola geometra* of Europe. It is about half the size of the European species, the largest example measuring, when fairly extended, approximately 10.75 mm. in total length, the greatest width of the body being about 1.50 mm.

For information as to colour, I am dependent upon Dr. Annandale, who has been good enough to send me notes upon the external features of several different individuals. From these notes it appears that the general colour of the body varies from bright to pale olive green, minutely speckled with black, or with a darker shade of green. A series of conspicuous white spots occur, one on either side of each somite, on the margins of the body, and these are connected across the dorsal surface by whitish and often indistinct bands.

Another series of somewhat irregular elongated spots or blotches lie in the mid-dorsal line, one in each somite (on a level with the marginal spots) and these median spots, which may or may not be joined together at their extremities, give the appearance of a somewhat ill-defined whitish mid-dorsal streak.

Anterior sucker circular, whitish, with three brownish bands on the dorsal surface; one band following the junction with the body, one near the anterior tip and a third and broader one between the two, in the posterior part of the sucker, which contains the eyes. The mouth-opening is situated in the centre of the interior cup.

Posterior sucker somewhat heart-shaped, of the same green colour as the body, with seven pairs of whitish rays, corresponding to the seven somites xxviii-xxxiv of which it is composed.

Several individuals examined showed traces of the original dorsal pattern, and from one of these the arrangement of spots and bands shown in Fig. 1 was drawn. It is to be understood that the arrangement indicated is schematic and subject to a good deal of variation in its details.

RINGS, SOMITES, GENITAL ORGANS, EYES.

The complete somite is formed of 14 annuli.

The transverse middle line of the complete somite passes through a ventral ganglion, and also through the middle of the white mid-dorsal and marginal spots. The ganglion occupies two rings (7 and 8) of the complete somite.

The pulsating vesicles have collapsed in the specimens examined, but traces of them occasionally may be seen, and their presence is placed beyond doubt by Dr. Annandale, who has noted that they occur in the whitish spots on the margins of the body. The first pair lie in somite xiii, and there appear to be eleven pairs, the last pair lying in somite xxiii.

The male genital orifice lies in somite xi, and the female orifice in somite xii.

There are two pairs of eyes on the anterior sucker, one pair on either side of the mid-dorsal line. The component eyes of each pair are linear in form and inclined together at an acute angle in such a way as to resemble the equal sides of an isosceles triangle lying horizontally, with its apex pointing towards the margin of the sucker.

The eyes in each pair do not actually touch at the point of inclination; they may be somewhat curved outwardly or, again, so closely approximated as to give, at first sight, the appearance of one linear eye.

HOSTS, HABITAT.

This leech is a fish parasite and has been recorded from *Hypolophus sephen*, *Tetrodon reticularis* and *Dorosoma indicum* (*Chatoessus chacunda*). It has so far only been found in the Chilka Lake. The following examples from this lake were examined:—

- (a) "Station 52. 4 mi. E. $\frac{1}{2}$ N. of Patsahanipur. On *Hypolophus sephen* (Forsk.) found crawling on lower surface of body, in the gill-slits, near the anus and within the mouth on the palate. Sp. gravity of water 1.007—1.011."
- (b) "Station 22. E. side of Rambha Bay, base of Ganta Sila. Sp. gravity of water 1.007—1.011. Found on a man's foot after wading."
- (c) "Station 49. 4-9 mi. E. $\frac{1}{2}$ S. of Barkul bungalow."
- (d) "Station 85. Satpara. On *Tetrodon reticularis* (Bl.). Sp. gravity of water about 1.026."
- (e) "Station 14. E. side of Rambha Bay. Sp. gravity of water 1.007—1.011."
- (f) "Station 55. 2-8 mi. N.E. $\frac{1}{2}$ E. of Kalidai."

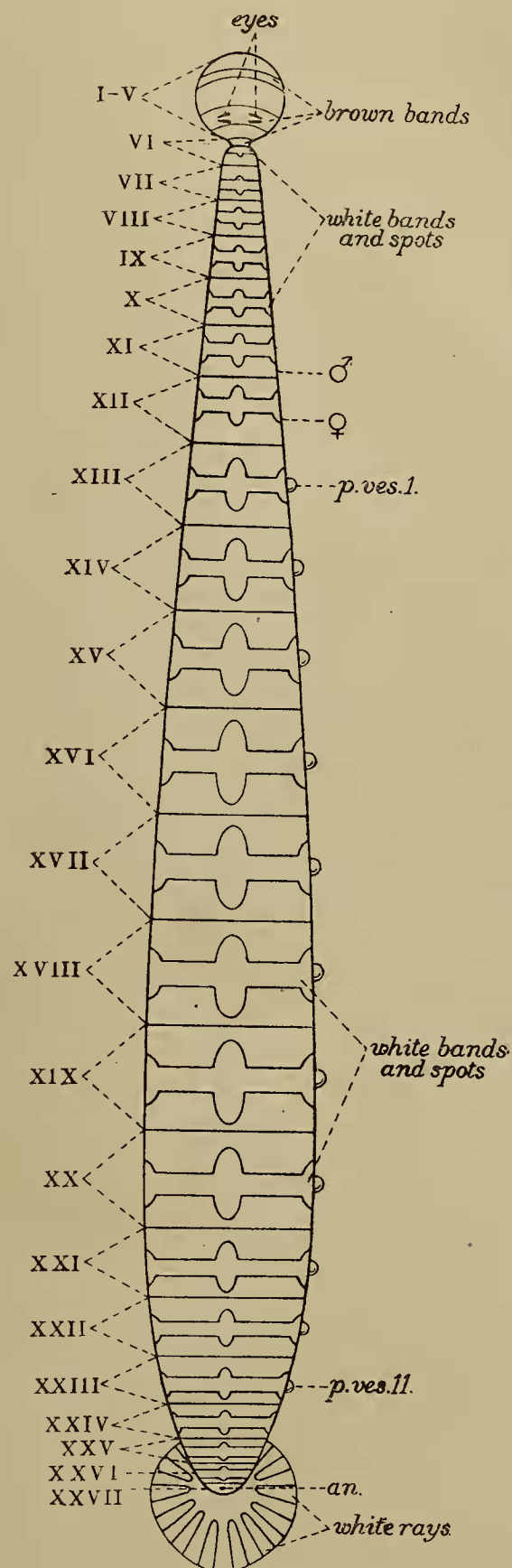


FIG. I.—*Piscicola olivacea*, n. sp. Diagram showing dorsal pattern, somites (numbered in Roman figures), eyes, etc. An, Anus; *p. ves. I* and *p. ves. II*, Pulsating vesicles (shown only on one side, for the sake of clearness) of first and eleventh pairs.

- (g) "Rambha Bay. Among weeds."
 (h) "Station 51. 5-7 mi. E. by N. of Patsahanipur."
 (i) "Station 64. Ghiakhala headland and neighbouring islands."
 (j) "Station 73. 7-4 mi. E. $\frac{1}{2}$ S. of Patsahanipur. On *Hypolophus sephen* (Forsk.)"
 (k) "Station 54. 2 mi. N.E. by N. $\frac{1}{2}$ N. of Kalidai.
 (l) "Off Barkul. From *Chatoessus chacunda*."

[A leech apparently identical with *Piscicola olivacea* is very abundant among algae on the shore of Barkuda Island, Chilka Lake, and I have also obtained specimens from a small pool of almost fresh water on the same island. In this pool the only vertebrates were frogs (*Rana cyanophlyctis*).—N. A.]

Additions to this preliminary description of *P. olivacea* will, it is hoped, appear at a later date.

N.B.—Along with the examples of *P. olivacea* were several specimens of another and apparently new species of leech closely resembling the former in size and form, without eyes and having at least fourteen rings to the complete somite. I give here Dr. Annandale's notes upon it, and it is doubtful if the material will yield much more information; the muscular expansion of the margins of the body giving the fin-like appearance described below is not evident after death.

"Leeches on lips of *Hypolophus sephen* (Forsk.) .. attached outside, close to junction of skin and teeth on both upper and lower jaws. No visible eye spots. Specimens seem to have a lateral fin on anterior two-thirds of body. Colour whitish .. Occasionally minute spots of faint pink on dorsal surface." Collected at "Station 43. 8 mi. S. S.W. of Kalidai, Chilka Lake. Sp. gravity of water 1.007—1.011."

Placobdella emydae, n. sp.

(FIG. 2).

EXTERNAL FEATURES—FORM, SUCKERS, ANNULI, SOMITES, EYES.

Body flattened, in extension elliptic-lanceolate, with the head region slightly dilated.

Dorsal surface with a roughened appearance due to the presence on each annulus of numerous small papillae.

Ventral surface without papillae and smooth.

The dorsal papillae vary in size and arrangement. A row of about 16-20 papillae are present on the first and third ring of the complete somite, whilst about twelve are more regularly disposed upon the middle ring. The middle ring of the somite (which lodges a ganglion of the ventral chain) has, amongst the others, three pairs of metameric papillae; a paramedian, an intermediate and a paramarginal pair, the intermediate pair being the largest.

N.B.—All papillae tend to disappear and may even be absent in improperly preserved specimens.

Anterior sucker pierced on its anterior lip by the mouth-opening; with a shallow

imperforate interior cup having a finely ribbed surface somewhat resembling that of the tip of the human finger.

Posterior sucker circular, centrally attached, narrower than the greatest width of the body, broader in proportion to the body-width in immature than in adult examples. Annuli 71, two being pre-ocular. The second and third annuli may show some division at their margins: the fifth is confluent with the free ventral edge of the anterior sucker: annuli 6 and 7 are separate above but sometimes so slightly divided as to appear as one ring: annulus 6 disappears ventrally, leaving the seventh (distinguished by papillae) to form the first ventral annulus following the anterior sucker.

Complete somite formed of three annuli. Somites i, ii and iii uniannulate; iv, xxv, xxvi and xxvii biannulate. The twenty somites v-xxiv are complete with three rings.

Eyes, one pair, closely approximated, situated normally in the third annulus, but sometimes between the third and second rings.

REPRODUCTIVE ORGANS, DIGESTIVE TRACT, NEPHRIDIOPORES.

Male genital orifice situated between annuli 26 and 27, that is, between somites xi and xii; female genital orifice situated two rings behind the male, between annuli 28 and 29, being the second and third rings of somite xii.

Epididymis large, long and thrown into complex coils and loops, the last loop extending as far down as the xvth somite, and returning upwards through two somites before again turning down to join the vas

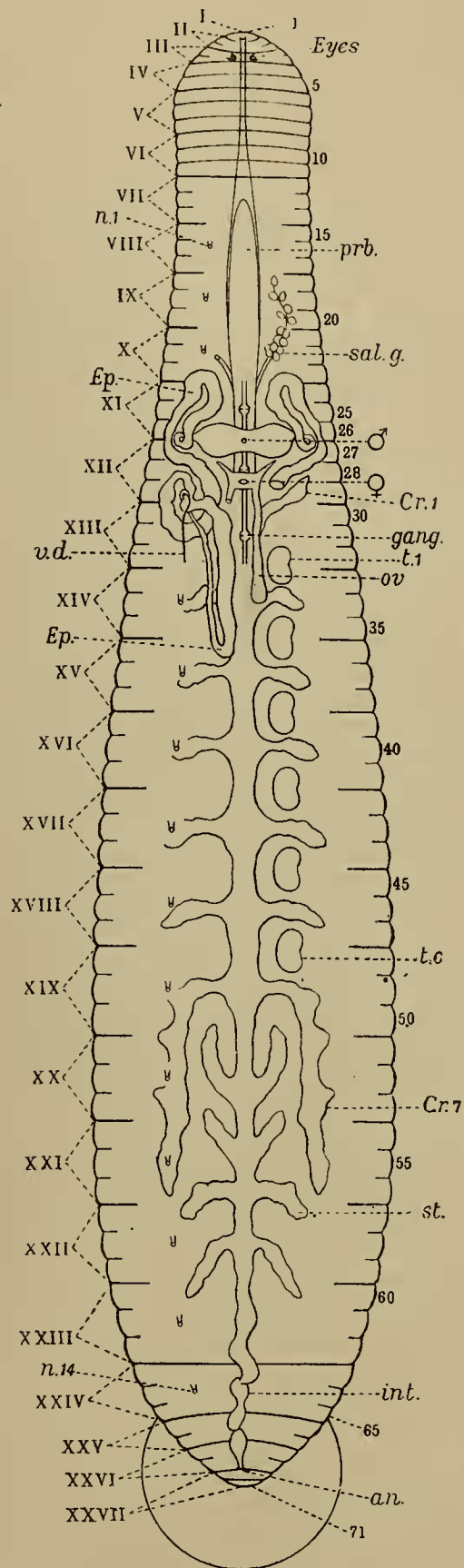


FIG. 2.—*Placobdella emydae*, n. sp. Diagram showing annulation, genital organs, digestive tract and other internal and external features.

The testes are shown on one side only, and the nephridiopores on the other for the sake of clearness, and other organs have been treated in the same manner and for the same reason. Somites numbered in Roman, and rings in ordinary figures.

prb. Proboscis. *sal. g.* Salivary glands. *Cr. 1* and *7*, First and seventh diverticula of Crop. *St.* Stomach. *int.* Intestine. *an.* anus. *gang.* one of the ventral ganglia. *n. 1* and *n. 14*, Nephridiopores of the first and fourteenth pair. *Ep.* Epididymis. *ud.* vas deferens. *t. 1* and *t. 6*, Testes of the first and sixth pairs. *ov.* ovary.

deferens. The large epididymes form a characteristic feature of the species and are not apparently symmetrical: one is usually shorter than the other. Testes 6 pairs, of kidney-like form. The ovaries are a pair of simple sacs prolonged anteriorly into horn-like processes.

Crop with seven pairs of lateral diverticula of fairly simple form and all posterior to the male genital orifice: the first pair reflected anteriorly, the last and longest pair reflected posteriorly. Stomach with the usual four pairs of lateral diverticula. Extensive salivary glands are present and the mouth, as already noted, occupies the nearly terminal position characteristic of the genus.

Nephridiopores, 14 pairs, situated upon annuli 16, 19, 22, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, and 64. A pair thus occurs upon the middle ring of somites viii-x and xiv-xxiv, none being present in somites xi-xiii. Each pore perforates the middle part of the ring in which it is located and lies about midway between the ventral margin and middle line.

HABITAT, HOSTS.

This little species has so far been found upon Mud-turtles of the genus *Emyda* and is not peculiar to Lake Chilka. In addition to (a) four individuals from this lake taken from *Emyda granosa*, Günth., subsp. *intermedia*, Annandale, I have the examples detailed below. (Information from notes enclosed with the material.)

- (b) "From *Emyda granosa*, Günth. Outskirts of Calcutta."
- (c) "From carapace of *Emyda granosa*, Günth. Gatiagurh, Dist. Hughly, Bengal."
- (d) "From carapace of *Emyda granosa*, subsp. *intermedia*, Annandale. R. Mahanaddi, Sambalpur, Orissa."
- (e) "From *Emyda granosa*, subsp. *intermedia*, near Purulia, Chota Nagpur Div., Bihar."
- (f) "From the turtle *Emyda vittata*, Nagpur, C.P." Dr. Annandale adds "The mud-turtle that occurs at Nagpur is probably *E. granosa intermedia*, and not *E. g. vittata*."

The examples from Lake Chilka, according to Dr. Annandale's notes, were collected at "Station No. 52, 4-9 mi. E. $\frac{1}{2}$ N. of Patsahanipur . . sp. gravity of water 1.007—1.011." This leech, therefore, is able, like its hosts, to accommodate itself to water of a certain degree of brackishness.

COLOUR AND SIZE.

For information as to the colour of this species, I am dependent upon Dr. Annandale who has provided me with notes taken from five different living individuals. From these notes, I am enabled to state that the ground colour varies from greyish green to pale olive brown or pale brown, the gorged crop appearing dull green through the semi-transparent body.

Dorsal surface with a distinct white median line, closely speckled with white and a darker green, the white specks being prominent on the margins of the body. Ventral surface olivaceous. Posterior sucker with whitish radiating lines, the inter-

spaces sometimes minutely speckled with grey-green. One of my examples in alcohol shewed that the speckled or tessellated appearance of the dorsal surface was due to the numerous small papillae covering it, which were tipped with white.

Size of the largest specimen examined : total length 13.5 mm., greatest width 9 mm.

LITERATURE.

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CASTLE, W. E. (1900). Some North American Fresh-water Rhynchobdellidae, and their parasites. *Bull. Mus. Zool. Harvard*, XXXVI, No. 2, pp. 42-43, pl. viii, fig. 38.